Forest Tent Caterpillar

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The forest tent caterpillar (*Malacosoma disstria* Hubner) may be found throughout the United States and Canada wherever hardwoods grow. It is a native insect that has attracted attention since colonial times. Regionwide outbreaks have occurred at intervals varying from 6 to 16 years in northern areas. Southern gum forests in southwest Alabama and southern Louisiana have had continuous infestations, especially in water tupelo "ponds," since 1948. Here, varying degrees of defoliation occur annually on 3½ million acres of gum forests.

Hosts

The favored hosts of this insect are broadleaved trees: in the Northeast, sugar maple and aspens; in the Lake States, quaking aspen and oaks; in the Appalachians and in the Central States, oaks; in the Midsouth and in southern coastal States, water tupelo, sweetgum, and swamp blackgum; in the Mississippi Valley, cottonwood and elms; in Texas, oaks; and in the Northwest, red alder and willow. Other tree species fed upon include birch, cherry, basswood, and ash. Species avoided are red maple, sycamore, and most conifers. After they have stripped trees, the caterpillars feed on brush species and even the leaves of cultivated fruits and vegetables.

Injury

The forest tent caterpillar often defoliates extensive areas (fig. 1). Successive, complete defoliations for 3 or more years can cause death of aspen and sweetgum. Diameter growth of defoliated water tupelo is reduced 75 percent or more and that of defoliated aspen, as much as 90 percent. Tree flowers may be eaten, nectar gathering by honeybees may be reduced, and seed production is diminished. During years when larvae hatch before leaves unfold, they mine buds. The quantity and quality of sugar maple sap are greatly reduced as a result of defoliation. New foliage appearing after spring defoliation may be stunted and thin.

An average of 19 egg masses on an aspen tree 6 inches in diameter indicates that complete defoliation could occur. Similar relation-

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Figure 1.—Forest tent caterpillars strip the leaves of aspen trees over extensive areas in the Lake States and Northeast.

ships between the number of egg masses and defoliation apply to the southern gum forest.

Life History and Description

There is one generation a year. Young larvae appear when the leaves are beginning to unfold. The time varies with weather and locality. Newly hatched larvae are nearly uniformly black, are less than ⅛ inch long, and bear conspicuous hairs. With each successive molt, markings of pale bluish lines along the sides of a brownish body and a row of footprint-shaped, whitish spots on a black background become more evident (fig. 2). When full grown, caterpillars are about 2 inches long.

The caterpillars do not spin a tent; instead, they form a silken mat on the trunk or branch, and here they congregate when at rest or during molting periods (fig. 3). During the early instars, these congregations are usually in the upper part of the tree; later they are more commonly found lower in the crown.

Larvae usually pass through five instars. When high populations result in complete tree defoliation, the fourth- and fifth-instar larvae often move around a great deal in search of food. The larvae wander in search of suitable sites for spinning cocoons, and their movements have caused them to be incorrectly named "armyworms."

Five to six weeks after hatching, the larvae spin cocoons of pale-yellow silk in a folded leaf (fig. 2(*5,6*)), bark crevice, or other sheltered place. In these cocoons, the larvae change to pupae (fig. 2(*2*)). The stout-bodied moths, which emerge about 10 days later, live for about 5 days. They are buff colored and have a wing span of 1 to 1½

Figure 2.—Life stages of the forest tent caterpillar: (1) Larvae, (2) pupae—female *left*, male *right*, (3) female moth, (4) male moth, (5) cocoons spun in rolled leaves, (6) parasitic fly on cocoon, (7) egg masses encircling twigs.

inches. The forewings have two darker oblique lines near the middle (fig. 2 (*3*)). Strong winds can carry the moths many miles.

The eggs are laid mostly on upper-crown branches in masses of 100 to 350, which encircle small twigs. Each mass is cylindrical with truncated ends (fig. 2(*7*)). The eggs are cemented together and are coated with a frothy, glue-like substance, which hardens and turns glossy dark brown. Within 3 weeks the embryos develop into first-instar larvae. The larvae overwinter in the eggs and hatch in the spring.

Natural Control

In some years hatch is low. When freezing weather follows hatching, many of the young caterpillars are killed. When trees are completely stripped of leaves, larvae starve. In the North, temperatures above 100° F. in the shade during the emergence of adults and the laying of eggs have caused death of moths and low viability of eggs.

Several species of flies and wasps parasitize the eggs, larvae, and pupae of the forest tent caterpillar. Most important are large

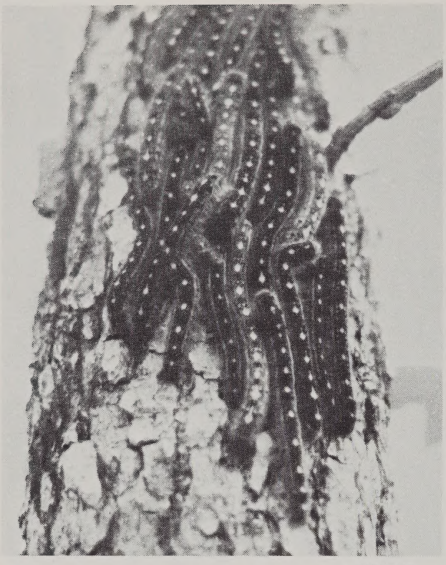

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Figure 3.— Forest tent caterpillar larvae congregate when at rest or during molting periods. A row of footprint-shaped spots is evident in the late larval stages.

gray flies, *Sarcophaga aldrichi* Parker and *Itoplectis conquisitor* (Say) in the North and *S. houghi* Aldrich in the South. Female flies deposit maggots on cocoons (fig. 2(*6*)). The maggots penetrate the silk and move into the prepupae or pupae, killing them as well as any other parasites that may be present.

S. aldrichi becomes extremely abundant and contributes greatly to the termination of outbreaks of the caterpillars in aspen forests. Although the flies do not bite, they annoy people by walking on their skin and by regurgitating on clothing and laundry hung outdoors. In southern gum forests, *S. houghi* is much less conspicuous and usually goes unnoticed. Nevertheless, it can be an important control agent.

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Figure 4.—Annual flooding in water tupelo forests of Alabama and Louisiana may suppress the buildup of some natural control agents.

Predatory beetles, ants, true bugs, spiders, birds, and small animals feed on caterpillars and pupae, but it is not known to what extent they affect populations of the forest tent caterpillar. Annual flooding of water tupelo forests in Alabama and Louisiana during the feeding period of the caterpillars (fig. 4) prevents the buildup of some natural control agents.

Polyhedral virus diseases often destroy large numbers of caterpillars. A fungus disease, *Entomophthorales* sp., is common in the South, and a protozoan infects larvae in the North.

Applied Control

Small trees can be protected by collecting and destroying egg masses, destroying colonies of young larvae at the ends of branches, or killing larvae clustered on the trunks or branches during molting and resting periods. Chemical control is sometimes necessary; consult a State or Federal pest-control specialist for the most up-to-date informaton.

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